

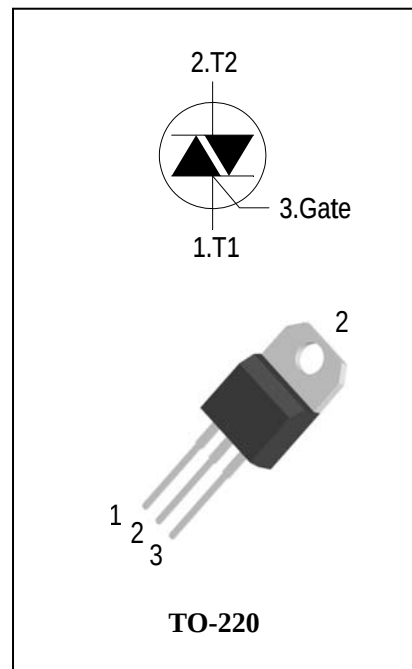
### 3 Quadrants High temperature Triacs

#### General Description

High current density due to mesa technology , guaranteed maximum junction temperature 150° C. The ADT16CH triac series is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, High power motor controls e.g. washing machines and vacuum cleaners, Rectifier-fed DC inductive loads e.g. DC motors and solenoids , motor speed controllers. The heatsink can be reduced, compared to traditional triacs, according to the high performance at given junction temperatures.

#### Features

- ◆ Repetitive Peak Off-State Voltage: 600V/800V
- ◆ R.M.S On-State Current (  $I_{T(RMS)}=16A$  )
- ◆ High Commutation  $dv/dt$
- ◆ High junction temperature operating capability
- ◆ These Devices are Pb-Free and are RoHS Compliant



#### Absolute Maximum Ratings

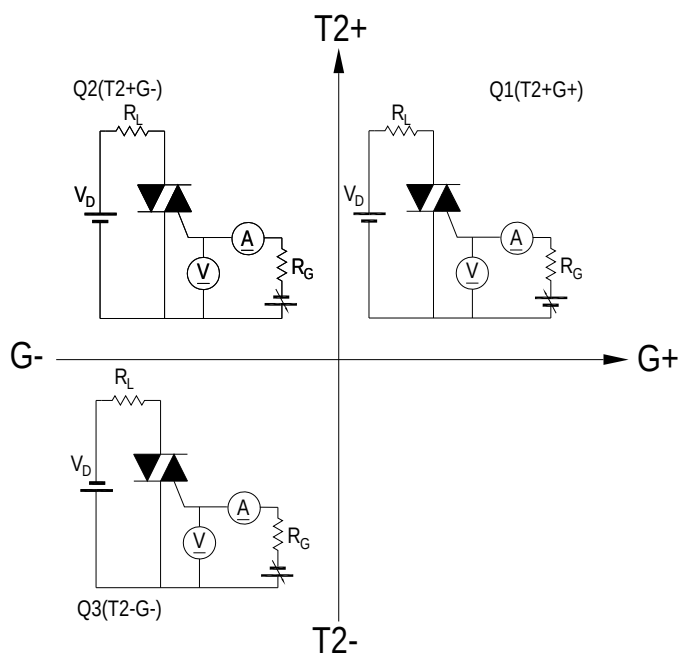
| Symbol                 | Items                                                          | Conditions                                                                                     |           | Ratings    | Unit        |
|------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------|------------|-------------|
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive Peak Off-State Voltage                              | $T_j = 25^{\circ}C$                                                                            | ADT16CH60 | 600        | V           |
|                        |                                                                |                                                                                                | ADT16CH80 | 800        | V           |
| $I_{T(RMS)}$           | R.M.S On-State Current                                         | $T_C = 120^{\circ}C$                                                                           |           | 16         | A           |
| $I_{TSM}$              | Surge On-State Current                                         | $t_p=20ms(50Hz)/t_p=16.7ms(60Hz)$                                                              |           | 180/188    | A           |
| $I^2t$                 | $I^2t$ for fusing                                              | $t_p=10ms$                                                                                     |           | 165        | $A^2s$      |
| $di/dt$                | Critical rate of rise of on-state current                      | $F = 120\text{ Hz}$ $T_j = 150^{\circ}C$<br>$I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$ |           | 50         | $A/\mu s$   |
| $I_{GM}$               | Peak Gate Current                                              | $t_p = 20\text{ }\mu s$ $T_j = 150^{\circ}C$                                                   |           | 4          | A           |
| $P_{G(AV)}$            | Average Gate Power Dissipation( $T_j=150^{\circ}C$ )           |                                                                                                |           | 1          | W           |
| $P_{GM}$               | Peak Gate Power Dissipation( $t_p=20\mu s, T_j=150^{\circ}C$ ) |                                                                                                |           | 10         | W           |
| $T_j$                  | Operating Junction Temperature                                 |                                                                                                |           | - 40 ~ 150 | $^{\circ}C$ |
| $T_{STG}$              | Storage Temperature                                            |                                                                                                |           | - 40 ~ 150 | $^{\circ}C$ |



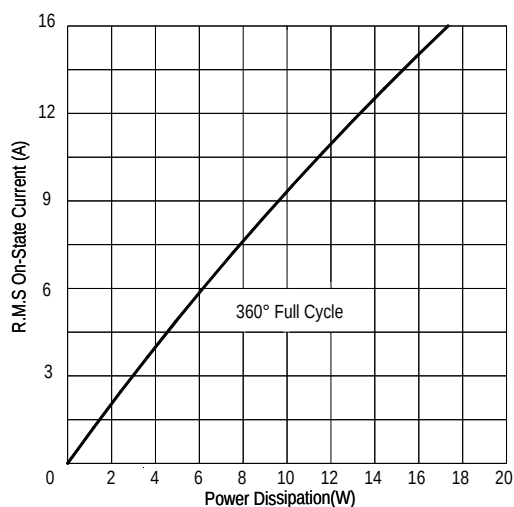
### Electrical Characteristics( $T_j = 25^\circ\text{C}$ unless otherwise specified )

| Symbol               | Items                                          |                          | Conditions                                                                          |      | ADT16CH60/80 |       |      | Unit |
|----------------------|------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------|------|--------------|-------|------|------|
|                      |                                                |                          |                                                                                     |      | S            | Blank | B    |      |
| I <sub>DRM</sub>     | Peak Forward Reverse Blocking Current          |                          | V <sub>DRM</sub> = V <sub>RRM</sub> , T <sub>j</sub> = 25°C                         | Max. | 5            |       |      | uA   |
| I <sub>RRM</sub>     |                                                |                          | V <sub>DRM</sub> = V <sub>RRM</sub> , T <sub>j</sub> = 150°C                        |      | 6.1          |       |      | mA   |
| V <sub>TM</sub>      | Peak On-State Voltage                          |                          | I <sub>TM</sub> = 25A, t <sub>p</sub> = 380 μs                                      | Max. | 1.55         |       |      | V    |
| V <sub>GD</sub>      | Q1-Q2-Q3                                       | Non–Trigger Gate Voltage | V <sub>D</sub> = V <sub>DRM</sub> R <sub>L</sub> = 3.3 kΩ<br>T <sub>j</sub> = 150°C | Min. | 0.2          |       |      | V    |
| V <sub>GT</sub>      | Q1-Q2-Q3                                       | Gate Trigger Voltage     | V <sub>D</sub> = 12V ,   R <sub>L</sub> = 33Ω                                       | Max. | 1.5          |       |      | V    |
| I <sub>GT</sub>      | Q1-Q2-Q3                                       | Gate Trigger Current     |                                                                                     | Max. | 10           | 35    | 50   | mA   |
| I <sub>H</sub>       | Q1-Q2-Q3                                       | Holding Current          | I <sub>T</sub> = 0.1A                                                               | Max. | 20           | 45    | 70   | mA   |
| I <sub>L</sub>       | Q1-Q3                                          | Latching Current         | I <sub>G</sub> = 1.2 I <sub>GT</sub>                                                | Max. | 20           | 50    | 90   | mA   |
|                      | Q2                                             |                          |                                                                                     |      | 35           | 80    | 110  |      |
| dV/dt                | Critical Rate of Rise of Off-State Voltage     |                          | V <sub>D</sub> = 2/3V <sub>DRM</sub> gate open<br>T <sub>j</sub> = 150°C            | Min. | 500          | 1000  | 1500 | V/μs |
| (dV/dt) <sub>c</sub> | Critical Rate of Change of Commutating Voltage |                          | V <sub>D</sub> =400V(dI/dt) <sub>c</sub> = -7A/ms<br>T <sub>j</sub> = 150°C         | Min. | 1            | 15    | 20   | V/μs |
| R <sub>th(j-c)</sub> | Junction to case (AC)                          |                          |                                                                                     | Max. | 1.2          |       |      | °C/W |
| R <sub>th(j-a)</sub> | Junction to ambient                            |                          |                                                                                     | Max. | 60           |       |      | °C/W |

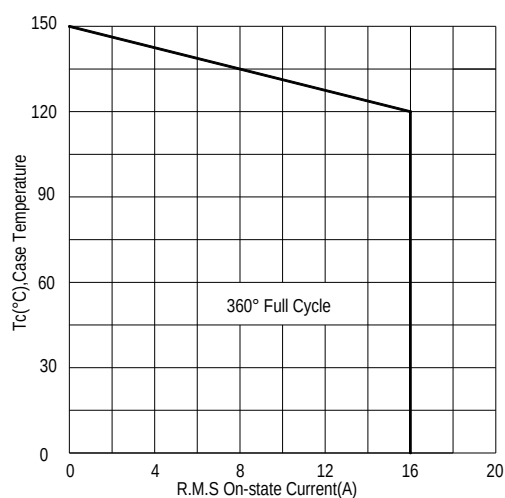
FIG.1: Triac quadrant are defined and the gate trigger test circuit



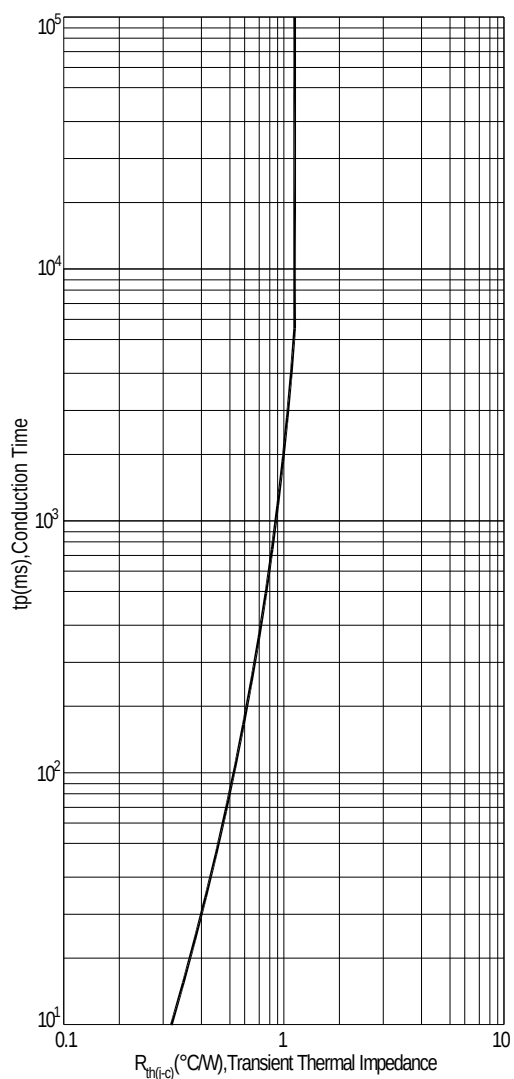
**FIG.2: Maximum on-state power dissipation**



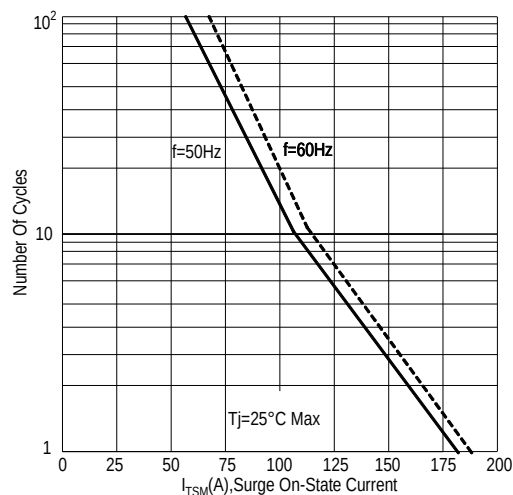
**FIG.3: Typical RMS on-state current VS Allowable case Temperature**



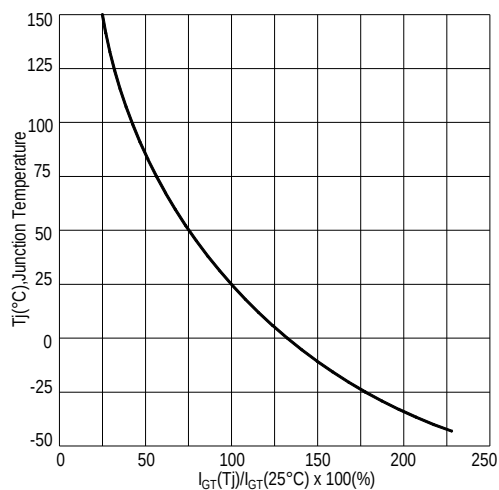
**FIG.4: Maximum transient thermal impedance**



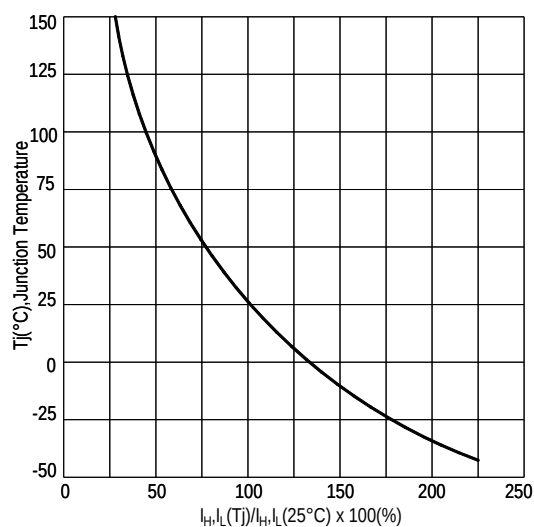
**FIG.5: Rated surge on-state current ( Non-Repetitive)**



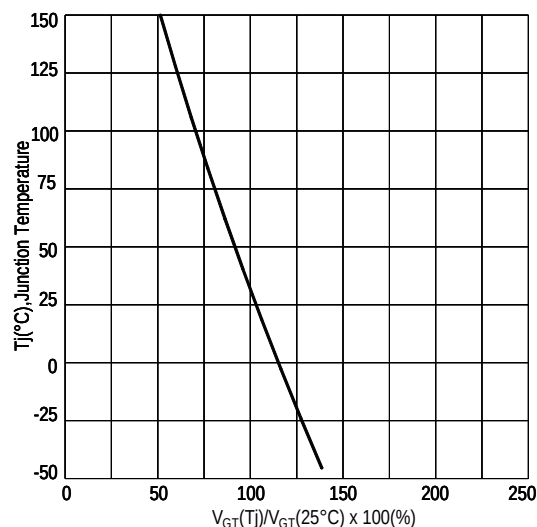
**FIG.6: Gate trigger current VS Junction temperature**



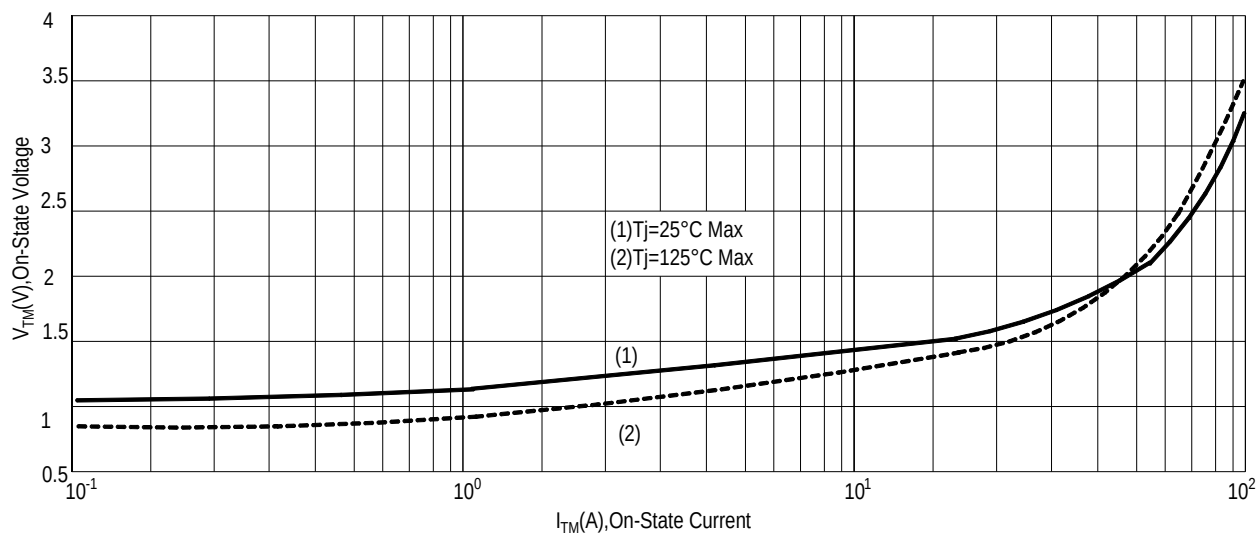
**FIG.7: Holding current and Latching current VS Junction temperature**



**FIG.8: Gate trigger voltage VS Junction temperature**

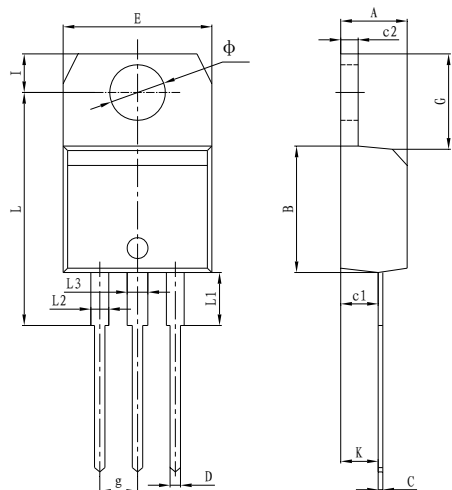


**FIG.9: On-state characteristics(Max)**



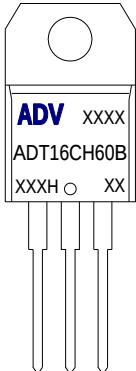
## PACKAGE MECHANICAL DATA

### TO-220 Package Dimension



| Symbol | Dimensions<br>In Millimeters |       | Dimensions<br>In Inches |       |
|--------|------------------------------|-------|-------------------------|-------|
|        | Min                          | Max   | Min                     | Max   |
| A      | 4.40                         | 4.60  | 0.173                   | 0.181 |
| B      | 9.00                         | 9.30  | 0.354                   | 0.366 |
| C      | 0.40                         | 0.60  | 0.015                   | 0.023 |
| c1     | 2.00                         | 2.60  | 0.078                   | 0.102 |
| c2     | 1.23                         | 1.32  | 0.048                   | 0.051 |
| D      | 0.70                         | 1.00  | 0.027                   | 0.039 |
| E      | 10.00                        | 10.40 | 0.393                   | 0.409 |
| g      | 2.40                         | 2.70  | 0.094                   | 0.106 |
| G      | 6.20                         | 6.80  | 0.244                   | 0.267 |
| I      | 2.65                         | 2.95  | 0.104                   | 0.116 |
| L      | 15.80                        | 16.80 | 0.622                   | 0.661 |
| L1     | 3.75                         |       | 0.147                   |       |
| L2     | 1.14                         | 1.70  | 0.044                   | 0.066 |
| L3     | 1.14                         | 1.70  | 0.044                   | 0.066 |
| Φ      | 3.60                         | 3.90  | 0.141                   | 0.153 |
| K      | 2.60TYP                      |       | 0.102TYP                |       |

### Making Diagram



**ADV:Logo**  
**ADT16CH60B:Part number**  
**X:Internal control code**  
**H:Halogen Free**

**AD T 16 C H 60 # S(B)**

|                                                                                                                                                            |                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><u>ADVANCED</u></p> <p><u>Internal control code</u></p> <p><u>Current:16=16A</u></p> <p><u>Quadrant:C=3Q</u></p> <p><u>High temperature:H=150°C</u></p> | <p><u>Sensitivity and type:</u><br/> S=10mA<br/> Blank=35mA<br/> B=50mA</p> <p><u>Package explain:Blank=TO-220</u><br/> Voltage:60=600V 80=800V</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|

### Ordering information

| Part number | Package | Marking    | Packing | Quantity |
|-------------|---------|------------|---------|----------|
| ADT16CH60#  | TO-220  | ADT16CH60# | Tube    | 50pcs    |
| ADT16CH80#  | TO-220  | ADT16CH80# | Tube    | 50pcs    |

Note:# = Gate Trigger Current Sensitivity and type

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